

The Development of Logical Project Termini

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I. Introduction

In developing a project concept which can be advanced through the stages of planning, environment, design, and construction, the project sponsor needs to consider a "whole" or integrated project. This project should satisfy an identified need, such as safety, rehabilitation, economic development, or capacity improvements, and should be considered in the context of the local area socioeconomics and topography, the future travel demand, and other infrastructure improvements in the area. Without framing a project in this way, proposed improvements may miss the mark by only peripherally satisfying the need or by causing unexpected side effects which require additional corrective action. A problem of "segmentation" may also occur where a transportation need extends throughout an entire corridor but environmental issues and transportation need are inappropriately discussed for only a segment of the corridor.

The Federal Highway Administration (FHWA) regulations outline three general principles at 23 CFR 771.111(f) that are to be used to frame a highway project:

In order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the action evaluated in each environmental impact statement (EIS) or finding of no significant impact (FONSI) shall:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Have independent utility or independent significance, i.e., be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The aim of this paper is to discuss criteria that can be used to select logical termini (project limits) for development of a project. The primary discussion will be on the first of the three factors mentioned above. However, all three are interrelated and necessary to the development of an integrated project.

The remainder of this paper is divided into three sections. Section II will further define logical termini. Section III will discuss several case studies covering factors that can come into play in choosing termini, and Section IV will offer some conclusions.

II. A Definition of Logical Termini

Logical termini for project development are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. The environmental impact review frequently covers a broader geographic area than the strict limits of the transportation improvements. In the past, the most common termini have been points of major traffic generation, especially intersecting roadways. This is due to the fact that in most cases traffic generators determine the size and type of facility being proposed. However, there are also cases where the project improvement is not primarily related to congestion due to traffic generators, and the choice of termini based on these generators may not be appropriate. The next section will show some examples where this is the case.

Choosing a corridor of sufficient length to look at all impacts need not preclude staged construction. Therefore, related improvements within a transportation facility should be evaluated as one project, rather than selecting termini based on what is programmed as short range improvements. Construction may then be "staged," or programmed for shorter sections or discrete construction elements as funding permits.

III. Sample Project Concepts and Discussion

A. Case #1

US 22 is a rural two lane facility without access control. A number of high accident locations have been identified, and the need for the project is to correct site specific geometric deficiencies between point A (Route 602) and point B (no intersecting roadway).

Discussion: In this case, the selection of A and B as termini is reasonable, given the scope of the project. In fact, for projects involving safety improvements, almost any termini (e.g., political jurisdictions, geographical features) can be chosen to correspond to those sections where safety improvements are most needed. The first criterion, that the project connect logical termini and be of sufficient length to

address matters on a broad scope, is largely irrelevant due to the limited scope of most safety improvements. Furthermore, even if other safety improvements are needed beyond those in segment A-B, the project termini need not be expanded to include these other improvements. The other two criteria still need to be met to choose A and B as termini: the safety improvements have independent utility (i.e., they can function as stand-alone improvements without forcing other improvements which may have impacts), and these improvements do not restrict consideration of other reasonably foreseeable transportation improvements (such as major safety improvements in an adjoining section, e.g., point B to Route 604, which could involve changes in alignment of the segment currently under review). Also, all environmental requirements must still be met. For instance, straightening of a curve through parkland cannot take place without completing the necessary section 4(f) analysis.

B. Case #2

US 26 is on the eastern fringe of a rapidly growing urban area. Over the next 20 years, traffic growth and congestion are predicted for the section of roadway closest to the urban area, between Route 100 and Route 200. Since US 26 also serves as a through facility to points east, congestion will increase on the other sections also. It is proposed to deal with the worst of the congestion problems by widening the road to four lanes between point A (Route 100) and point B (Route 200).

Discussion: Widening between point A and point B could be implemented as a reasonable project with logical termini, but several conditions would have to be met:

- The project serves an identified need to upgrade US 26 in the suburban area, and stands on its own from point A to point B.

- The improvement will not force immediate transportation improvements on the remainder of the facility (i.e., the project will not substantially increase congestion or safety problems on the mountainous section of US 26 beyond the problems under the no-build case). If improvements are forced, there could be project impacts severe enough (e.g., 4(f), endangered species) to complicate completion of US 26 in the mountainous section, and this should be investigated now. This would be to see whether alternatives for other foreseeable transportation improvements have been restricted to the point where environmental requirements will be difficult or impossible to satisfy.

- If there is a demonstrated need for improvements in the entire corridor from point A to point C, there may still be no funding available and no likelihood of improving the entire corridor in the near future. In this case, the project from point A to point B could still be implemented providing the above conditions were met.

If there is potential for improvements to the whole US 26 corridor in the near future, and if there may be alternate alignments to satisfy the project need that will change the alignment in the AB section, it would be prudent to evaluate the entire corridor from A to C. Assuming limited funds, the suburban section could be programmed for staged construction first, and subsequent sections could be reevaluated at the appropriate time. However, as long as the AB segment represents a stand-alone project (i.e., all three of the criteria in 23 CFR 771.111(f) are met), there is no environmental requirement to consider the entire corridor in one document. The only issue that needs to be treated with care is to leave enough flexibility in alternative selection in future upgrading of the entire corridor so that environmental requirements can be satisfied (e.g., don't build the AB segment in a way that it would be a "loaded gun" forcing the upgrading to point C to take 4(f) property, which otherwise would have been avoided).

C. Case #3

The proposed project is a new interchange with I-28 at the north edge of a growing urban area with options to upgrade an existing north-south feeder/collector route, Kellogg Rd., on a new location. The next interchange south is at capacity now due to 1) new housing in the north end of town, and 2) a rapidly expanding commercial area at the existing interchange. The identified purposes of this project are to reduce circuitous travel for north end residents and to reduce congestion at the next interchange south.

Discussion: At first glance, the logical termini for analysis are the points where the new interchange ties in with existing facilities (Kellogg Rd. and Drury Rd.). Would this action force other project improvements? In this example, Kellogg Rd. and Drury Rd. may be overloaded by interchange traffic. If this is considered now, there may be design options to address this without substantial change or disruption. If this is dealt with later, the options may be more limited. If the only remaining option in the future is to widen Kellogg Rd. and Drury Rd., there may be considerable disruption, relocations, etc., which could possibly have been avoided. For this particular project, the eastern project terminus was the intersection of Coleman St. and Drury Rd., since there was adequate capacity on Drury Rd. to absorb the traffic and no additional improvements would be forced. The western project terminus was further away from the intersection,

since Kellogg Rd. did not have enough capacity to handle the traffic from the interchange. The terminus in this case was where Kellogg Rd. intersected with Chris Rd. It was demonstrated that Chris Rd. had the capacity to handle the additional traffic and that no additional improvements would be forced. Options for upgrading Kellogg Rd. included widening of the existing Kellogg Rd. or a north-south feeder road on new alignment. Even if the project sponsor had decided not to upgrade Kellogg Rd., the environmental document should have covered the environmental impacts resulting from the congestion of this route (e.g., community disruption, possible air quality violations).

D. Case #4

This proposed facility is on new alignment, connecting Route 91 with I-17. Alternative 1 is shorter, connecting to I-17 at point A, and alternative 2 would tie in further east, at point B. The primary travel on this new facility is to and from points east on I-17. I-17 is four lanes west of point B and six lanes east of point B. Alternative 2 has been designated as the preferred by the project sponsor. Alternative 1 was proposed by a citizen's group to reduce the number of relocations and community disruption. Cost estimates are \$50 million for alternative 1 (to tie in at point A) and \$63 million for alternative 2 (to tie in at point B).

Discussion: It is likely that an incomplete picture of the costs and impacts of alternative 1 is being provided by only carrying the analysis as far as point A. For both alternatives, consideration of impacts should continue to point B, or east of B if there are likely to be any weaving or merging problems which will force changes in the facility beyond B. In this example, the four lane section between A and B, if overloaded by alternative 1, would force further improvements on I-17 which would likely have additional impacts. Failure to take this into account would underestimate the cost and overall impacts of alternative 1 and skew decision making. As a result of these factors, if Alternative 1 is considered a reasonable alternative, the discussion of impacts should extend to impacts occurring at point B. If I-17 will be able to handle the increased traffic from alternative 1 without widening, then the discussion could simply be a demonstration of that fact.

IV. Conclusions

The aim of this paper has not been to present all possible ways of determining logical project termini, but rather to present a thought process that can be used to make these determinations on a case by case basis. For the vast majority of highway projects, the choice of logical termini will be obvious and non-controversial. For those few major projects where other considerations are important, the termini chosen must be such that:

- environmental issues can be treated on a sufficiently broad scope to ensure that the project will function properly without requiring additional improvements elsewhere, and
- the project will not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

By following this guidance, proposed highway projects will be more defensible against litigation claims of project segmentation, and decision makers and the public will have a clearer picture of the transportation requirements in the project area and a better understanding of the project purpose and need.